Version with markings to show changes made.

<u>In the Specification:</u>

Paragraph on page 12, beginning on line 8:

Yet another preferred, simple-to-use, embodiment <u>is</u> (shown in Figure 10) in which 3 display LEDs **20** are employed. One LED **20** is activated upon commencement of mounting activity <u>(e.g. "suspect estrus")</u>; the next LED **20** is activated when qualified mounting activity occurs <u>(e.g. "confirmed estrus")</u>. That activity which is determined to meet the device's predetermined and preset thresholds, e.g., 3 mounts in 4 hours. The last LED **20** is activated when the animal is within the range of time for breeding, thus, indicating to the herdsman to breed the animal at the next opportunity <u>(e.g. "optimum time to breed")</u>.

<u>In the Claims:</u>

1. A self-contained electronic estrus detection device for optimum breeding time calculation <u>and indication</u> comprising:

a housing <u>for releasable placement on an animal</u>; and~~,~~

an electronic means <u>operatively associated with said housing</u> for detecting~~,~~ <u>and</u> processing <u>information relating to number, duration, and frequency of mounts on said animal, said electronic means calculating and indicating optimum time to breed based on said information.</u>~~and indicating mounting activity data, said electronic means consisting essentially of a controller means, a processing means, a power means, an activation means and at least one indicating means mounted within said housing.~~

2. The estrus detection device as defined in claim 1, wherein said <u>information includes if said duration of said mounts meet a preset threshold of time and if a preset number of said mounts occur within a predetermined period of time.</u>~~electronic means detects mounting activity, actuating the processing means according to preprogrammed thresholds and indicates satisfaction of said thresholds by visible indicator.~~

3.~.___ The estrus detection device as defined in claim ~2~1, wherein said ~controller~electronic means includes a microprocessor.

4. The estrus detection device as defined in claim ~2~1, wherein said ~power~electronic means includes at lease_t one battery.

5.~.___ The estrus detection device as defined in claim ~2~1, wherein said ~activation~electronic means includes a pressure sensitive switch.

6. The estrus detection device as defined in claim ~2~1, wherein said electronic means further calculates and indicates ~indicating means~suspect estrus and confirmed estrus. ~includes at least one visible display means.~

7. The estrus detection device as defined in claim ~6~1, wherein said electronic means includes a visible display means_. ~includes LED.~

8. The estrus detection device as defined in claim 7, wherein said visible display means ~for indicating suspect estrus, confirmed estrus or optimum time to breed.~is at least one LED.

9. The estrus detection device as defined in claim ~2~1, wherein said~unitary~ housing is hermetically sealed.

10. The estrus detection device as defined in claim ~2~1, further comprising a reset means for resetting said electronic means.~the processor and/or controller mans.~

11. A self-contained electronic estrus detection device comprising:

a housing for releasable placement on an animal; and~,~

an ~electronic~indicating means for ~detecting, processing and~ indicating ~mounting activity data,~suspect estrus, confirmed estrus and optimum time to breed.~said electronic means consisting essentially of a controller means, a processing means, a power means, an activation means and a let least one indicating means mounted within said housing;~

~~wherein said electronic means detects mounting activity, actuating the processing means according to preprogrammed thresholds and indicates satisfaction of said thresholds by visible indicator.~~

12.   The estrus detection device as defined in claim 6 wherein said suspect estrus is determined by said duration of a first mount meeting said preset threshold of time.

13.   The estrus detection device as claimed in claim 6 wherein said confirmed estrus is determined by said duration of said mounts meeting said preset threshold of time and said preset number of said mounts occurring within a predetermined period of time.

14.   The estrus detection device as defined in claim 2 wherein said optimum breeding time is a predetermined range of time from the first of said preset number of said mounts meeting said preset threshold and occurring within said predetermined period of time.

15.   The estrus detection device as defined in claim 11 wherein said indicating means is located on the rear of said housing.

16.   The estrus detection device as defined in claim 11 wherein said indicating means comprises at least one LED.

17.   The estrus detection device as defined in claim 11 wherein said indicating means is 3 LED's, each of said 3 LED's indicating either suspect estrus, confirmed estrus or optimum time to breed.

18.   The estrus detection device as defined in claim 2 wherein said preset threshold of time is about 3 seconds.

19.   The estrus detection device as defined in claim 2 wherein said preset number of mounts is 3 mounts and said predetermined period of time is about 4 hours.

20.   A self-contained electronic estrus detection device comprising:

a housing for releasable placement on an animal; and

an electronic means operatively associated with said housing for detecting and processing information relating to the number, duration, and frequency of mounts on said animal, said information forming the basis for determining if the duration of said mounts meet a preset threshold of time and if a preset number of said mounts occur within a predetermined period of time, said electronic means calculating and indicating suspect estrus, confirmed estrus and optimum time to breed if said duration of said mounts meet said preset threshold of time and if said preset number of said mounts occur within said predetermined period of time.

21.   A self-contained electronic estrus detection device comprising:

a housing for releasable placement on an animal;

electronic means operatively associated with said housing for detecting and processing information relating to the number, duration and frequency of mounts on said animal; and

indicating means for indicating the beginning and end of optimum time to breed based on said information.

Currently claims 1-21 are pending in the application. Claims 1, 11, 20 and 21 are in independent form. Applicants have amended claims 1-11. Claims 12-21 are new claims.

Claim 1 has been amended to recite "an electronic means operatively associated with said housing for detecting and processing information relating to number, duration, and frequency of mounts on said animal, said electronic means calculating and indicating optimum time to breed based on said information."

Claim 11 has been amended to claim "an indicating means for indicating suspect estrus, confirmed estrus and optimum time to breed."

Applicants have also added new claims 12-21. Claims 12-19 are dependent claims and add no new matter. Claims 20 and 21 are new independent claims that applicants believe are novel and not obvious in light of the prior art of record. These claims add no new matter, and have adequate support in the specification.

Initially, Applicants note that the drawings as filed are informal and are appropriate for examination only. Applicants will submit formal drawings upon receipt of notice that the application contains allowable subject matter.

REJECTIONS UNDER 35 U.S.C. § 102(b)

In the Office Action, the Examiner rejected claims 1-7 and 9 under 35 U.S.C. § 102(b) as being anticipated U.S. Pat. No. 4,846,106 ("*Leonardo*").

With respect to the Examiner's rejection, applicants respectfully submit that claims 1 and 11 (as amended) contain elements not disclosed, either explicitly or inherently by *Leonardo*.

Specifically claim 1, as amended, claims an electronic means operatively associated with said housing for detecting and processing information relating to number, duration, and frequency of mounts on said animal, said electronic means calculating and indicating optimum time to breed based on said information. *Leonardo* does not disclose an electronic means that calculates and indicates the optimum time to breed based on information relating to number, duration and frequency of mounts on an animal.

Leonardo, instead simply counts the number of times a switch is depressed and starts a timer running from the moment that the switch is depressed for the first time. The differences between the apparatus disclosed in *Leonardo* and the present claimed invention are numerous and significant. For example, *Leonardo* is only capable of measuring and indicating the <u>onset</u> of estrus, and does so in an inaccurate manner at that. The onset of estrus is the point at which the first meaningful mount is measured. *Leonardo* measures the first depression of the switch, which may or may not be a meaningful or valid mount. Instead, this may be another animal leaning its chin on the tailhead of the animal or a short mount which the animal quickly runs away from.

The electronic means in claim 1 on the other hand, calculates and indicates the optimum time to breed. This is accomplished by measuring information such as how many mounts occur within a specified period of time, e.g. three mounts within a four hour period. This frequency measurement provides an accurate estimation of "confirmed estrus" or "true estrus" and also provides an accurate starting point for measuring the optimum time to breed, which has been scientifically determined in dairy cows to be about 4 to 14 hours from the first mount that occurred within the specified period of time. *See* Specification, pg. 16, lines 14-18 and Fig. 4.

Moreover, the electronic means of claim 1 allows for a user, such as a herdsman, to simply look at the device and immediately determine whether the cow is within the optimum time period to breed. None of the prior art cited by the Examiner, including *Leonardo*, discloses or suggests the use of an electronic means for calculating and indicating optimum time to breed based on information relating to number, duration, and frequency of mounts.

For these reasons, applicants respectfully submit that *Leonardo* does not disclose an electronic means as claimed in claim 1 and therefore does not anticipate claim 1. Accordingly, applicants respectfully request withdrawal of the rejection of claim 1.

Claim 11, as amended, claims an indicating means for indicating suspect estrus, confirmed estrus and optimum breeding time. The indicating means of claim 11 provides an indication of mounting activity far above and beyond that disclosed by *Leonardo*. The present invention provides the user with a simple, visible indication as to whether a valid mount has occurred ("suspect estrus"), whether the requisite number of mounts within the specified period

of time has occurred ("confirmed estrus"), and whether optimum breeding time has been reached. Each of these determinations requires a different calculation, all of which are provided internally by the claimed invention.

As discussed in the specification, it has been scientifically determined that three valid mounts within a four hour period is an accurate indication that a dairy cow is in heat ("confirmed estrus"). The present claimed invention has an indication means that <u>directly displays to the user whether the animal is actually in heat and requires no calculation or estimation by the user himself</u>.

All the references cited by the Examiner in the Office Action, including *Leonardo* require additional calculations to be done by an individual user, such as a herdsman, to confirm estrus and to determine optimum time to breed. For example, *Leonardo* requires the user to read the timer and the number of mounts and personally calculate whether the requisite number of mounts has occurred within the requisite time.

The present invention provides for a simple, self-contained indication means for indicating whether the animal is in heat or is within the optimum breeding period (e.g. 4-14 hours from the first valid mount for dairy cows). None of the references cited by the Examiner disclose or suggest such an indication means.

For these reasons, applicants respectfully submit that *Leonardo* does not disclose the indication means in claim 11 and therefore does not anticipate claim 11. Accordingly, Applicants respectfully request withdrawal of the rejection of claim 11.

REJECTIONS UNDER 35 U.S.C. § 103

In the Office Action the Examiner also rejected claims 8 and 11 under 35 U.S.C. § 103(a) as being unpatentable over *Leonardo* and further in view of U.S. Pat. No. 5,111,799 ("*Senger et al.*").

With respect to the Examiner's rejection of claims 8 and 11, neither *Leonardo* nor *Senger et al.* disclose an indication means for indicating suspect estrus, confirmed estrus and optimum time to breed. As discussed with respect to the rejections under 35 U.S.C. § 102(b) above,

Leonardo is only capable of indicating the onset of estrus. Moreover, this indication is often misleading because *Leonardo* is not capable of distinguishing between true mounts and false mounts. While *Senger et al.* discloses an estrus detection system which allegedly analyzes the duration of mounting to discriminate standing heat mountings from shorter durations spurious mountings, it does not disclose an indication means which indicates suspect estrus and the optimum time to breed. Again, as discussed with respect to the rejections above, the determination of the optimum time to breed requires additional calculations to be done by the user and therefore is more time consuming. A device which is capable of indicating suspect estrus, confirmed estrus, and the optimum time to breed provides the user with extremely valuable information upon a brief examination of the device itself.

Moreover, the disclosure in *Senger et al.* states that "mounting events which last for approximately 5 seconds or longer are standing heat events. . . ." *Senger et. al.,* Col. 8, lines 16-18. However, it has been determined that the threshold time period for a valid mount in cows is as little as 3 seconds. Therefore, the disclosure of a 5 second threshold, which is all that *Senger et al.* is capable of measuring, would not accurately detect the first valid mount and therefore would not be expected to provide an accurate measure of suspect estrus, confirmed estrus, or optimum time to breed.

For these reasons, applicants submit that a combination of *Leonardo* with *Senger et al.* would not yield a device having an indication means for indicating suspect estrus, confirmed estrus and optimum time to breed.

Accordingly, Applicants respectfully submit that the Examiner's rejection of claims 8 and 11 under 35 U.S.C. § 103(a) is improper and therefore should be withdrawn. Applicants respectfully request such action.

The remaining rejections are to dependent claims. Applicants submit that the dependent claims are allowable for at least the same reasons as expressed with respect to the independent claims above. Applicants; however, reserve the right to argue the patentability of the dependent claims should the Examiner not allow the independent claims.

CONCLUSION

In view of the preceding amendments and remarks, it is respectfully submitted that this application is now in condition for allowance and such action is respectfully requested. If any points remain at issue, which the Examiner feels could best be resolved by telephone interview, he is urged to contact the attorney below.

Signed at Denver, Colorado, this 24th day of August, 2001.

Respectfully submitted,

Robert J. Scheffel, Reg. No. 43,090
DORSEY & WHITNEY LLP
USPTO Customer No. 20686